

A Higher Level of Performance



User Manual

Centurion Guided Radar

CGR Series



For more information, please visit >

www.hawkmeasure.com





Contents

Overview	3	Powering The Unit For The First Time	19
Principle of Operation	3	Displayed Information	20
Function	3	Displayed Measurements	20
Features	3	Displayed Diagnostics	20
Primary Areas of Application	3	Software Parameters	21
Wiring & Dimensions	4	Setup Menu	21
Wiring Terminal Compartment	4	Digitize / Measured Range Reference	22
Dimensions Housing + Gland	4	Digitize Function	22
Dimensions - Reference	4	Measured Range Reference	22
Dimensions	5	Software Parameters	23
Dimensions - Probe Variants	5	Advanced Menu	23
Cable Weight Tank Fastening Kit	6	Setup Procedure	24
Safety Instructions	7	Commissioning	24
CGR2 Series Wiring in Hazardous Locations	7	HART	25
Installation Guide	8	HART Universal Command List	25
Mounting - Instruction for Rotating the Housing	8	HART Common Practice List	26
Placement Requirements	9	Status / Diagnostic Flags	26
Nozzle / Socket Mounting	9	Software Flow Chart	27
Stand Pipe / Flanged Mounting	10	Troubleshooting	30
Mounting - Conductive Vessel	11	Part Numbering	32
Mounting - Non Conductive Vessel	11	Centurion Guided Radar System	32
Gland Entry Wiring	11	Probe Combination Table	33
Securing the end of the probe	12	Accessories	33
Flexible Probe Movement	12	Flange Table	34
Hardware Adjustment	13	Specifications	35
Adjusting Probe Length	13	Ordering Instructions	38
Rotating Ex d Rated Enclosures (page 1 of 2)	14		
Rotating Ex d Rated Enclosures (page 2 of 2)	15		
Rotating non Ex d Rated Enclosures (page 1 of 2)	16		
Rotating non Ex d Rated Enclosures (page 2 of 2)	17		
Forces On The Probe	18		



Overview

Centurion Guided Radar



Principle of Operation

Guided-wave technology sends the radar pulse down a probe to measure either liquids or solids.

The pulse hits the surface and is reflected back up the probe to the sensor, where the transit time is translated into a distance using time of flight and time expansion.

The amplitude of the reflection depends on the dielectric constant of the product.

Function

The HAWK range of Guided Radar products are ideal for the measurement of liquids, sludge, powders and granules to a range of 18.5m for level and interface. This technology is not affected by pressure, temperature, viscosity, vacuum, foam, dust, changes in dielectric constant or coating of the probe.

Primary Areas of Application

- | | |
|-----------------------|--------------------|
| • Chemicals | • Food & Beverages |
| • Petrochemicals | • Oil & Gas |
| • Cement | • Pharmaceutical |
| • Building Aggregates | • Pulp & Paper |
| • Mining / Minerals | • Wastewater |

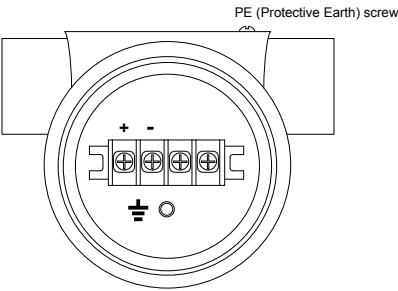
Features

- | | |
|---|---|
| • Explosion proof housing option | • Precise & continuous accuracy |
| • IECEx Ex d [ia] ia IIC T6 Gb Ga | • 2 wire loop |
| • Up to 18.5m (60ft 8in) range | • 4-20mA, HART Universal / Common practice commands |
| • Very short minimum range (150mm, 6") | • Protection class IP66, Nema 4x |
| • Simple setup | • Measures extremely low dielectric (1.5) |
| • Auto-Calibration to any dielectric ≥ 1.5 | • Programmable fail safe mode |
| • Adjustable Sensitivity | |

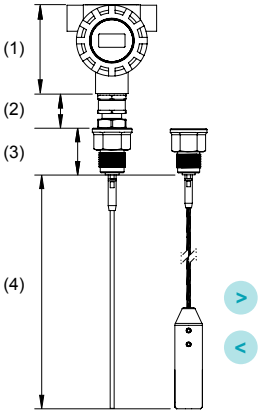


Wiring Terminal Compartment

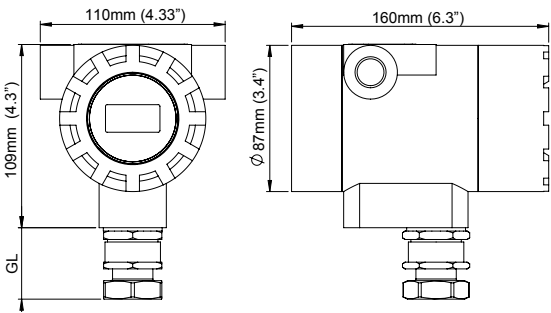
Dimensions - Reference



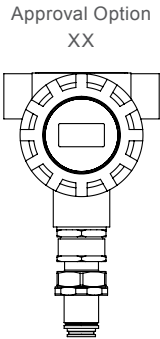
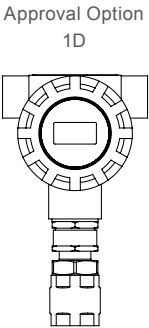
1	Housing
2	Gland / Gland + High Temp. Extension
3	Threaded Connection / Flange
4	Probe Length



Dimensions Housing + Gland



Housing with Process Temperature option '2'. Visual reference only.



Gland Length (GL)			
Process Temperature Option*	Approval Option*	GL	
		mm	in
1	XX	50	2.0
1	1D	57	2.2
2	XX	136	5.3
2	1D	97	3.5

*Consult Part Numbering / Specifications for technical information



Dimensions - Probe Variants

A04 / A06 / A08

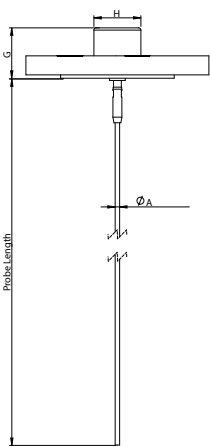
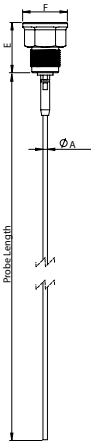
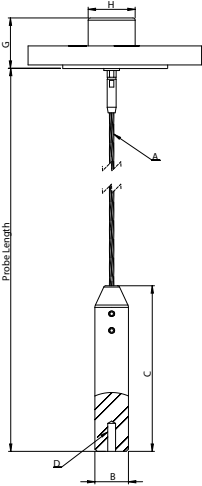
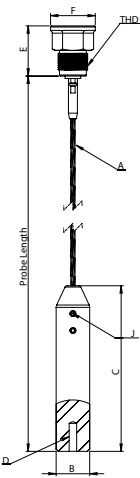
B04 / B06 / B08

Threaded

Welded Flange

Threaded

Welded Flange



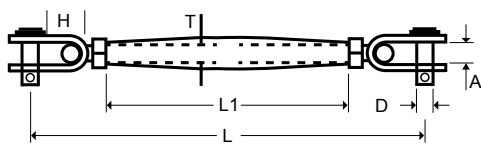
Probe / Cable Dimensions											
Probe Type	THD BSP or NPT	A		B		C		E		F	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
A04, B04	3/4	4	0.16	22	0.9	120	4.7	45	1.8	40	1.6
A06, B06	1	6	0.24	28	1.1	150	5.9	45	1.8	40	1.6
A08, B08	1-1/2	8	0.31	36	1.4	200	7.8	72	2.8	64	2.5
	Welded Flange	G		H							
		mm	in.	mm	in.						
A04, B04		45	1.8	42	1.6						
A08, B08		72	2.8	70	2.7						



Cable Weight Tank Fastening Kit

The tank fastening kit (CGR-A0X-WL-SS) includes 2 eye bolts and 1 adjustable rigging lock.

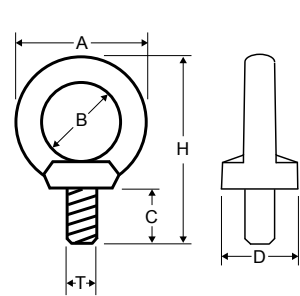
Rigging Lock



Dimensions	
T (thread)	M12
A	14mm (0.55")
D	12mm (0.47")
H	25mm (0.98")
L	252mm (9.9")
L1	150mm (5.9")

Recommended Working Load	983kg (1.05 ton)
Total Deformation Load	3750kg (4.13 ton)
Weight	576g (1.27lb)

Eye Bolt



Dimensions	
T (thread)	M10
A	40mm (1.57")
B	25mm (0.98")
C	21mm (0.82")
D	20mm (0.79")
H	63mm (2.48")

Recommended Working Load	675kg (0.74 ton)
Total Deformation Load	2600kg (2.87 ton)
Weight	60g (0.13lb)



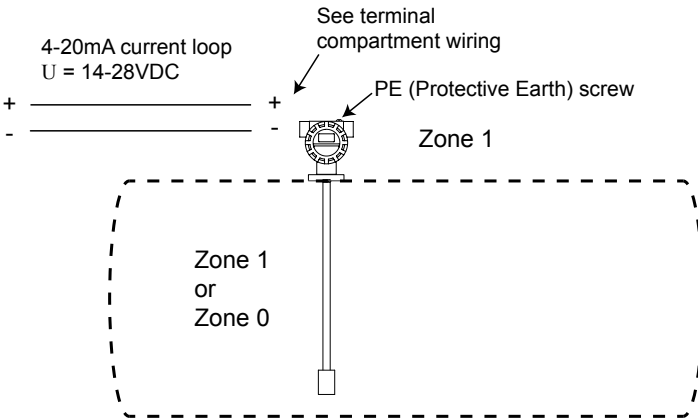


Safety Instructions

For installation requirements for Hazardous Locations please refer to appropriate Safety Instruction document located at:

<http://www.hawkmeasure.com/productdetail.asp?id=57>

CGR2 Series Wiring in Hazardous Locations



NOTE: (Ref Safety Instructions Sect 10a)

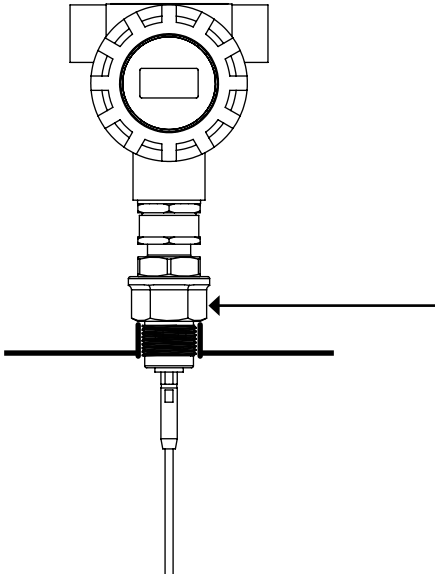
Application of supply voltages above 28VDC will cause damage to the equipment.

Voltages less than the U_m will not invalidate the type of protection.



Mounting - Instruction for Rotating the Housing

There are specific rotation points which should be used while mounting the unit into place.
The Housing Compartment should never be used to rotate the device during mounting.
For rotating the housing after installation see 'Rotating the Enclosure' section.



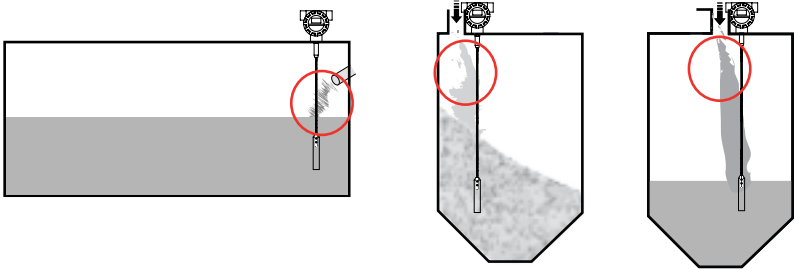
When Installing the CGR unit,
use spanner or wrench **ONLY** at
Process Fitting as indicated.



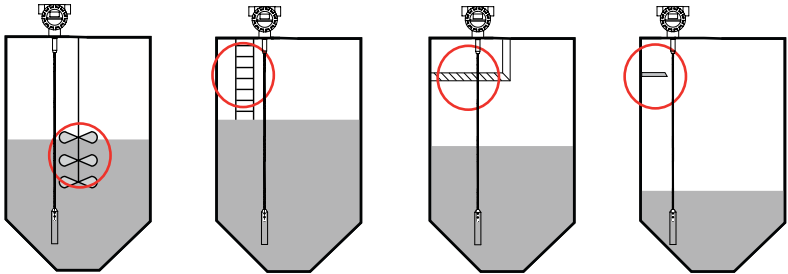


Placement Requirements

Do **NOT** mount near infeed

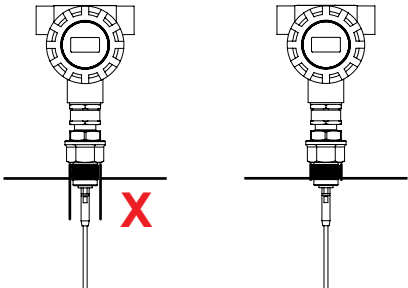


Do **NOT** mount over or adjacent to **any** obstacles



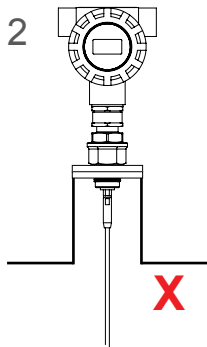
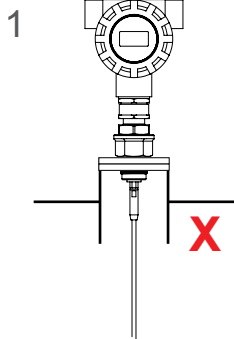
Nozzle / Socket Mounting

Nozzle / Socket should not protrude into vessel



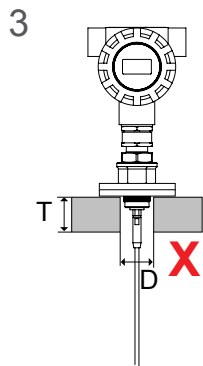


Stand Pipe / Flanged Mounting



1. Stand pipe should not protrude into vessel.

2. Do not mount in long narrow stand pipe.



3. Roof Thickness (T) should not exceed Diameter (D) of cut away.





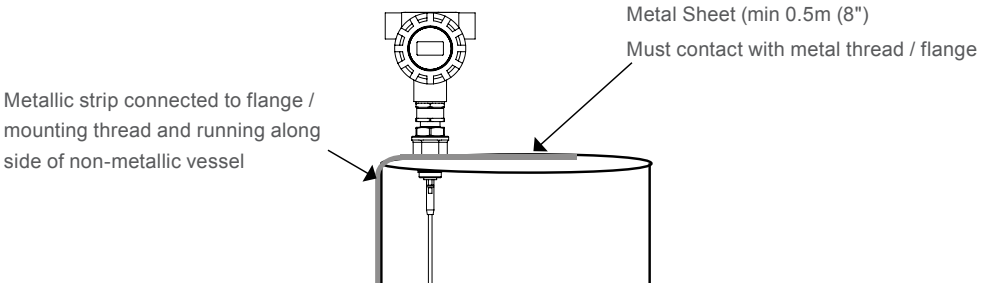
Mounting - Conductive Vessel

Unit performance is most optimized when there is a ground reference between the mounting (metal flange or thread) and the vessel. Metallic or metal reinforced vessels are ideal.

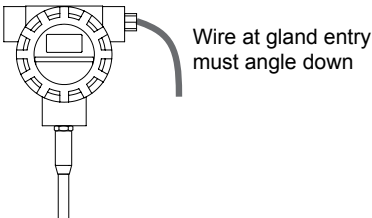
Mounting - Non Conductive Vessel

A non conductive vessel will require a conductive metal strip or equivalent connected to the metal flange or thread and running along side the vessel for at least the Probe insertion length. A conductive metal sheet (min 0.5m (8")) should also be mounted on the roof and be in contact with metal thread or flange.

If a seal / gasket is used between the flange and the vessel ensure non coated / painted bolts are used to create ground reference with vessel.



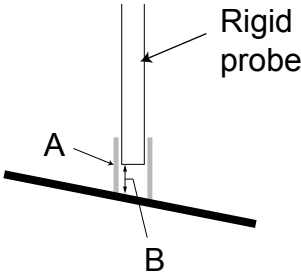
Gland Entry Wiring



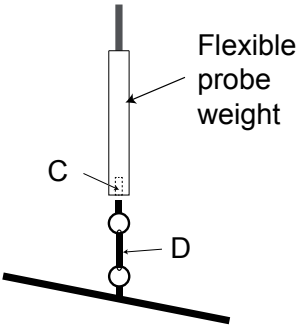


Securing the end of the probe

- Securing the end of rigid probes is not required unless there is risk of excessive lateral forces.
- Securing flexible cable weight via M10 thread on base of weight is recommended to prevent movement.



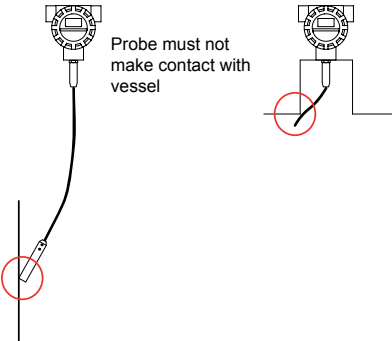
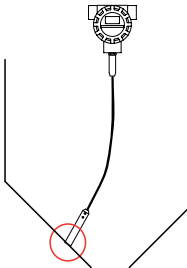
A	Metal socket
B	Floor clearance (min 50mm, 2")



C	M10 thread
D	Cable Weight Fastening Kit or appropriate O ring & link secured to vessel floor.

Flexible Probe Movement

- Avoid mounting adjacent to internal structures (eg ladders, walkways). The cable must not make contact with any part of the vessel
- Take into consideration that material forces may push probe laterally. Secure Cable Weight if required.





Adjusting Probe Length

Rigid Probes

Cut rigid probes to appropriate length. After adjustment, you must change the 'ProbeLength' Parameter in 'Advanced' menu to represent the new length (password 222).

Flexible Probes

- (a) Mark the point at which the flexible cable enters the cable weight.
- (b) Release the cable weight grub screws with hex key.
- (c) Measure and note the length of cable concealed within cable weight.
- (d) Cut cable noting the length of cable must include the concealed length above.
- (e) Re-insert the cable into the weight and tighten grub screws to tightening Torque of 20Nm.
Use loctite 243 or equivalent on grub screws to secure once completed.
- (f) Adjust ProbeCalibr Parameter in 'Advanced' menu to represent new length (password 222).





Rotating Ex d Rated Enclosures (page 1 of 2)

The Ex d gland which couples the sensing probe to the flameproof enclosure provides a critical sealing function for the enclosure. Internal wires are passed through this gland and the high integrity seal. This gland incorporates a Union Joint which is designed to rotate.

However this rotation is limited to one-time adjustment of Display orientation after installation on site, as shown below:

ONLY one 36mm spanner applied to the Hex of Union Joint to rotate enclosure to desired orientation as allowed. DO NOT hold the enclosure during this procedure.



As Installed, but LCD display not visible.



Rotation at Union Joint
Max 180° allowable one-time rotation in either direction.



Desired Orientation.

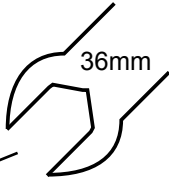
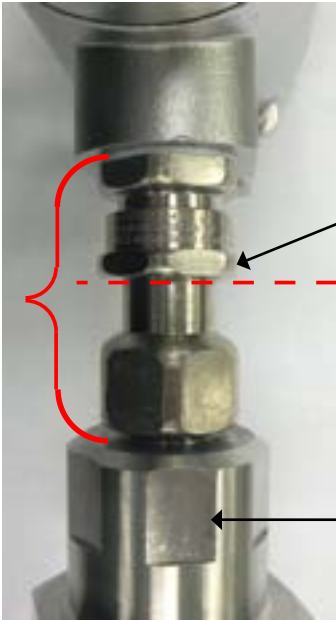
Rotation beyond these strict limits can damage the internal cables

Ensure Enclosure follows the spanner rotation and assembly integrity is not compromised



Rotating Ex d Rated Enclosures (page 2 of 2)

This is a Sealed Threaded Joint.
It must NOT be loosened or broken.



Plane of Rotation

When Installing the CGR unit, use spanner or wrench ONLY at Process Fitting as indicated.





Rotating non Ex d Rated Enclosures (page 1 of 2)

The gland which couples the sensing probe to the enclosure provides a critical sealing function for the enclosure. Internal wires are passed through this gland and the high integrity seal. This gland incorporates a Union Joint which is designed to rotate.

However, this rotation is limited to one-time adjustment of Display orientation after installation on site, as shown below:

ONLY one 36mm spanner applied to the Hex of Union Joint to rotate enclosure to desired orientation as allowed. DO NOT hold the enclosure during this procedure.



As Installed, but LCD display not visible.



Rotation at Union Joint
Max 180° allowable one-time rotation in either direction.



Desired Orientation.

Rotation beyond these strict limits can damage the internal cables

Ensure Enclosure follows the spanner rotation and assembly integrity is not compromised



Rotating non Ex d Rated Enclosures (page 2 of 2)

This is a Sealed Threaded Joint.
It must NOT be loosened or broken.



Plane of Rotation

When Installing the CGR unit, use spanner or wrench ONLY at Process Fitting as indicated.





Forces on the probe

Tensile forces are heavily dependent on the viscosity and abrasive characteristics of the product in the vessel. Ensure tensile loading is appropriate for the selected cable as well as the silo cover and mounting structure. In critical cases it is better to select the larger flexible cable (8mm).

Probe Type	Tensile Load
A04 (4mm flexible cable @ 20°C, 68°F)	0.5 Ton
A06 (6mm flexible cable @ 20°C, 68°F)	1.0 Ton
A08 (8mm flexible cable @ 20°C, 68°F)	4.0 Ton

Lateral forces can exist due to movement and gradual flow of the product in the vessel, particularly with powder and granular materials.

These forces can cause stress and strain on the probe, as well as the process fitting and mounting hardware. Ensure that lateral forces are minimized by following the installation guidelines and Placement Requirements.

Probe Type	Lateral Load
B04 (4mm rigid probe @ 20°C)	1 Nm
B06 (6mm rigid probe @ 20°C)	3 Nm
B08 (8mm rigid probe @ 20°C)	8 Nm

Powering The Unit For The First Time

Centurion Guided Radar



Installation should only be performed by suitably qualified personnel.

- A. Confirm mounting is within recommended specifications.
- B. Check the selected unit matches the required application specifications.
For Hazardous Locations see appropriate safety instructions available at <http://www.hawkmeasure.com>
- C. Check the wiring is correct and all connections are secure.
- D. Apply power to the unit.

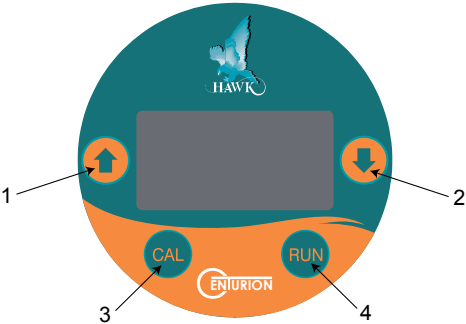
When power is applied the unit will start its normal load sequence.
The following messages will cycle on the display.

Hawk
CGR Series
Serial Number
Software Revision



Menu Navigation

- 1 Navigate up, increase value
- 2 Navigate down, decrease value
- 3 Proceed, select, save
- 4 Go back, return unit to operational mode

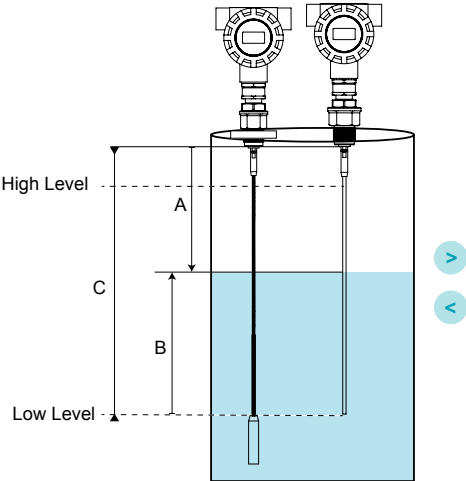




Displayed Measurements

Measured Span Reference

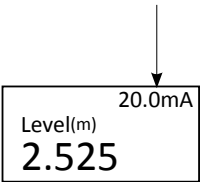
A	Distance - measured from base of thread or bottom of flange to material level
B	Level - measured from Low level to material level
C	% Level - proportional percentage of measured level based on Low and High level setting



Displayed Diagnostics

While pressing the arrow buttons the top corner of the display cycles through various unit diagnostics

mA	Current output in mA
Normal	Unit operating normally
Failed	Unit in failsafe conditions
Recover	Unit searching for level / attempting to amplify signal





Setup Menu

Main Menu

► Setup

Advanced

Autoset

Parameter	Description	Options
Display Mode	Select default Display mode	Volume ⁽²⁾ Level %Level Distance
Display Unit	Adjust displayed measurement unit	Centimeters Metres Feet Inches
Low Level	Set Low Level (4mA) distance	Adjustable
Hi Level	Set High Level (20mA) distance	Adjustable
Damping	Adjust output response time & smoothness	Adjustable
Tracking	Program application Fill and Empty speeds. InstaTrack is a special mode which we respond immediately to any detected reflection. 'Test' Mode adjusts unit function to be suitable for bench testing and demonstration. The unit will track nearest detected reflection regardless of size.	• Fast • Medium • Slow • InstaTrack • Test
Dielectric	Applies a pre-set value to Sensitivity based on selected Dielectric Constant range of material.	• <2 • <10 • <40 • >80 • <5 • <20 • <80
Fail Mode	Set Analogue failsafe output	3.50mA 20.20mA LastKnown 4mA 20.00mA
Fail Time	Set time delay for FailSafe condition (in seconds)	Adjustable
Digitize	Perform auto-Digitization routine to set Sensitivity and digital false reflection mapping based on the application conditions. The unit will display either the measured level or end of probe. The value is adjustable. If adjusting ensure the value is not greater than the material level.	• Yes • No

(1) See 'Measured Range Reference' on next page
(2) Volume activation requires Goshawk. See dedicated CGR Goshawk manual.





Digitize Function

The 'Digitize' function is an automatic setup routine used to eliminate false reflections and apply the Sensitivity value for the unit (which is based on the selected Dielectric parameter).

The selection of the 'Dielectric' pre-set creates a base line for the unit's Sensitivity range it will use *after* the Digitization process. Select a lower Dielectric pre-set if there is any doubt.

The unit will prompt the measured distance (either the material level or end of probe). The distance is adjustable if the displayed distance is not the correct material level.

Ensure the value is not greater than the material level.

For best results follow this routine:

- 1) Ensure the unit is mounted according to mounting specifications and requirements.
- 2) Ensure the material to be measured is in contact with the actively measured part of the probe.
- 3) Select Dielectric pre-set value of most similar to material to be measured.
- 4) Run Digitize routine. Confirm displayed distance is either material level or end of probe if vessel is empty.

Measured Range Reference

A	Blanking (non-measurable zone)
B	Measurable Span (blanking to top of cable weight or end of rigid probe). High level must be = to or > than Blanking

Minimum Range (Blanking)

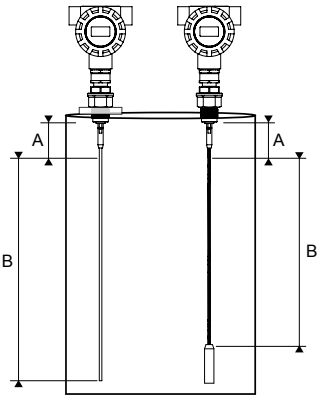
Probe
Variant

A04	150mm (6")
A06	150mm (6")
A08	150mm (6")
B04	150mm (6")
B06	150mm (6")
B08	150mm (6")

Maximum Range

Probe
Variant

A04	18.5m (60ft 8in)
A06	18.5m (60ft 8in)
A08	18.5m (60ft 8in)
B04	4m (13ft 1in)
B06	4m (13ft 1in)
B08	4m (13ft 1in)





Advanced Menu

- Main Menu

Setup

▶ Advanced

Autoset

Parameter	Description	Options
Comms	Adjust communication protocol settings. The default ID is 0, and the default baud rate is 1200.	• Device ID • Baud Rate
Sensitivity	Manual adjustment of Sensitivity. Digitize automatically sets this value based on application conditions. Sensitivity is the primary adjustment for the unit's ability to detect media	• 0-100
Blanking	Blanking is a non-measurable zone. This can be increased to 'Blank' out high level false echoes caused by mounting	• Adjustable <150mm (3") is not recommended
Analog	Adjust Analog output. Switch from 4-20mA to 20-4mA Fine tune both 4mA current and 20mA current reading Park (Lock) Current to 4, 8 or 12mA.	• 4-20 • 20-4 • 4mA tuning • 20mA tuning • Park 4mA • Park 8mA • Park 12mA
Factory Reset	Restore all parameters to factory default.	• Yes • No
Device Info	Display device information	
Lock Code	Enable / Disable lock code. If enabled, select lock code number.	• Enable / Disable
ProbeCalibr	If physical length of probe is adjusted you must run this routine for the system to re-detect the probe end. Nothing should be touching the probe when commencing this function. Do not adjust the probe length of hazardous location rated units	• Adjustable • Password protected (222)
Dist Calibr	Calibrate distance correction factor. Some applications or environments can affect time of flight signal travel affecting the measured distance reading . This function allows the detected distance to be adjusted to suit the application.	• Adjustable



Commissioning

For commissioning via PC and Goshawk see dedicated CGR Goshawk Manual.

Parameter	Instruction
1. Set High and Low level	High and Low level distances can be programmed manually or you can run Autoset. Autoset can be used to program the High or Low level based on the material level which is touching the probe when the function is run.
2. Set Tracking Speeds	Tracking speeds can be set to Fast, Medium, Slow and Custom (measured in Displayed Units per hour)
3. Select application Dielectric	Choose closest Dielectric range from the pre-set list. Select lower value if unsure.
3. Run Digitize	Run the CGR Digitize routine to automatically set the reflection mapping and Sensitivity range for the installation. This function can be performed in both empty vessel or with material contacting the probe. You will be prompted to enter a distance value (measured from base of probe down). This will either be the material level or the end of probe. If material level is not displayed, choose a lower Dielectric
4. Add Damping	Increasing Damping value if a smoother response trend is required. This value is automatically set by the Tracking speed.
5. Run unit	Press RUN several times to commence unit operation





HART Universal Command List

Revision 5
Universal Commands

Command No.	Function
0	Read unique identifier
1	Read Primary Variable
2	Read current and percent of range
3	Read current and four predefined dynamic variables.
6	Write polling addr
7	Read loop configuration
8	Read Dynamic Variable Classifications
11	Read unique ident. Associated with tag
12	Read message
13	Read Tag, Description, Date
14	Read PV sensor information
15	Read output information
16	Read final assembly number
17	Write message
18	Write Tag, Description, Date
19	Write final assembly number
20	Read Long Tag



HART Common Practice List

Revision 5

Common Practice Commands

Command No.	Function
34	Write Primary Variable Damping Value
35	Write Primary Variable Range Value
36	Set Primary Variable Upper Range Value
37	Set Primary Variable Lower Range Value
38	Reset Configuration Changed Flag
40	Enter/Exit Fixed Primary Variable Current Mode
44	Write Primary Variable Units
45	Trim Primary Variable Current Dac Zero
46	Trim Primary Variable Current Dac Gain
57	Read Unit Tag, Descriptor, Date
58	Write Unit Tag, Descriptor, Date
59	Write Number Of Response Preambles
109	Burst Mode Control
110	Read All Dynamic Variables

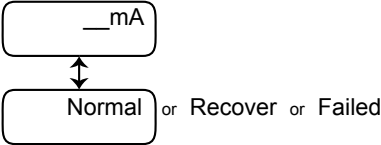
Status / Diagnostic Flags

Status / Diagnostic Flags
Device Malfunction (Fails safe status)
Configuration Changed
Cold Start
Output Current Fixed
Primary Variable Out of limits

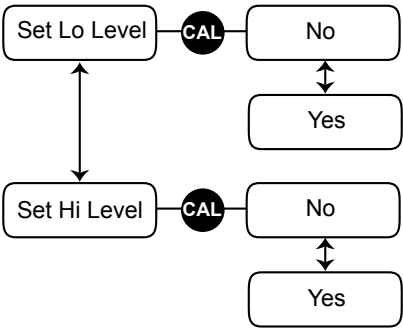




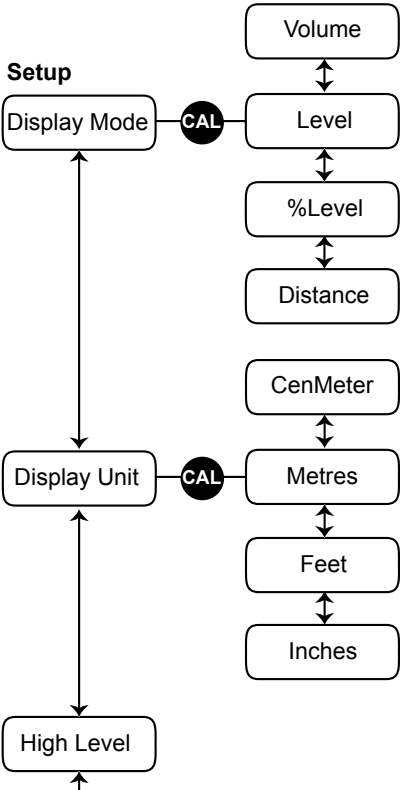
Diagnostics

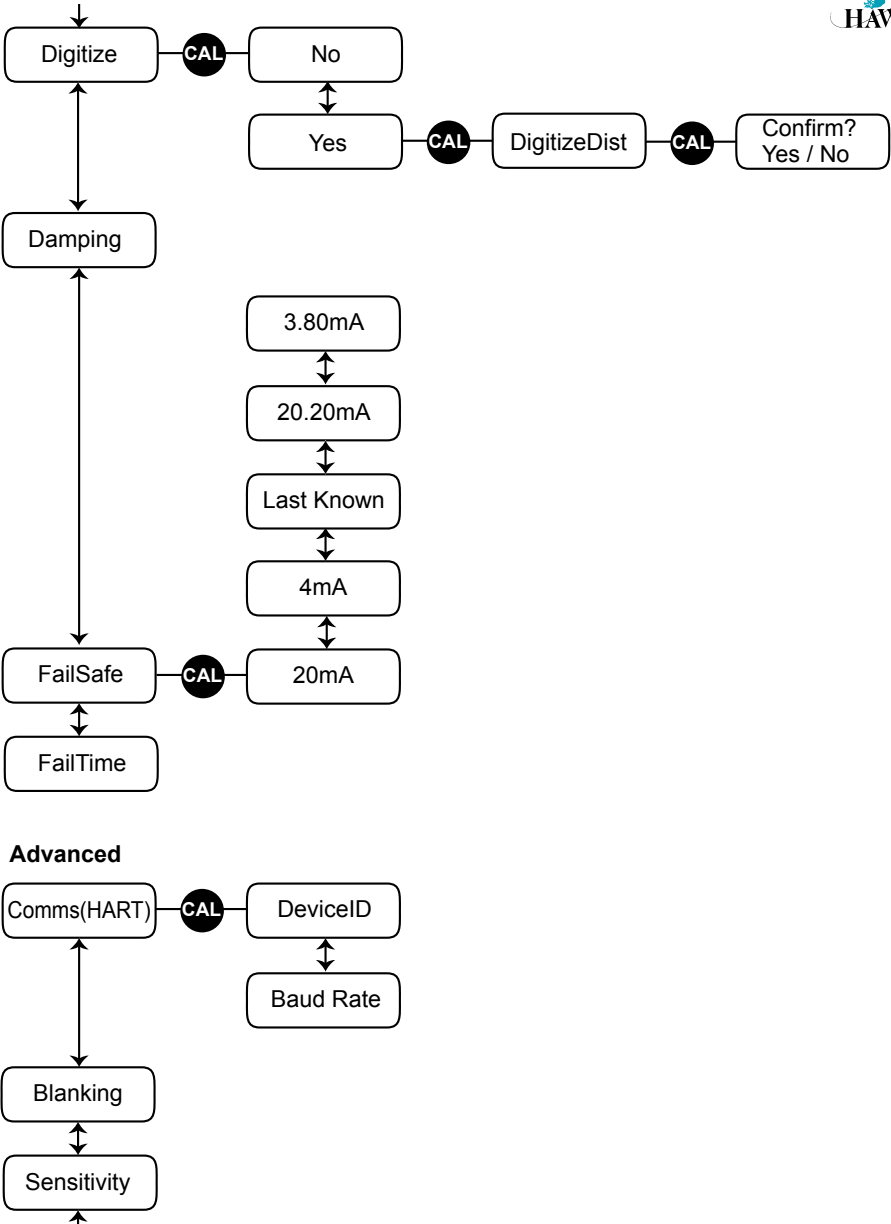


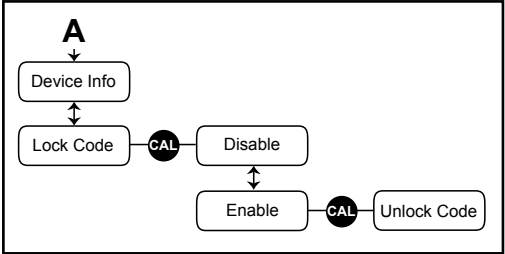
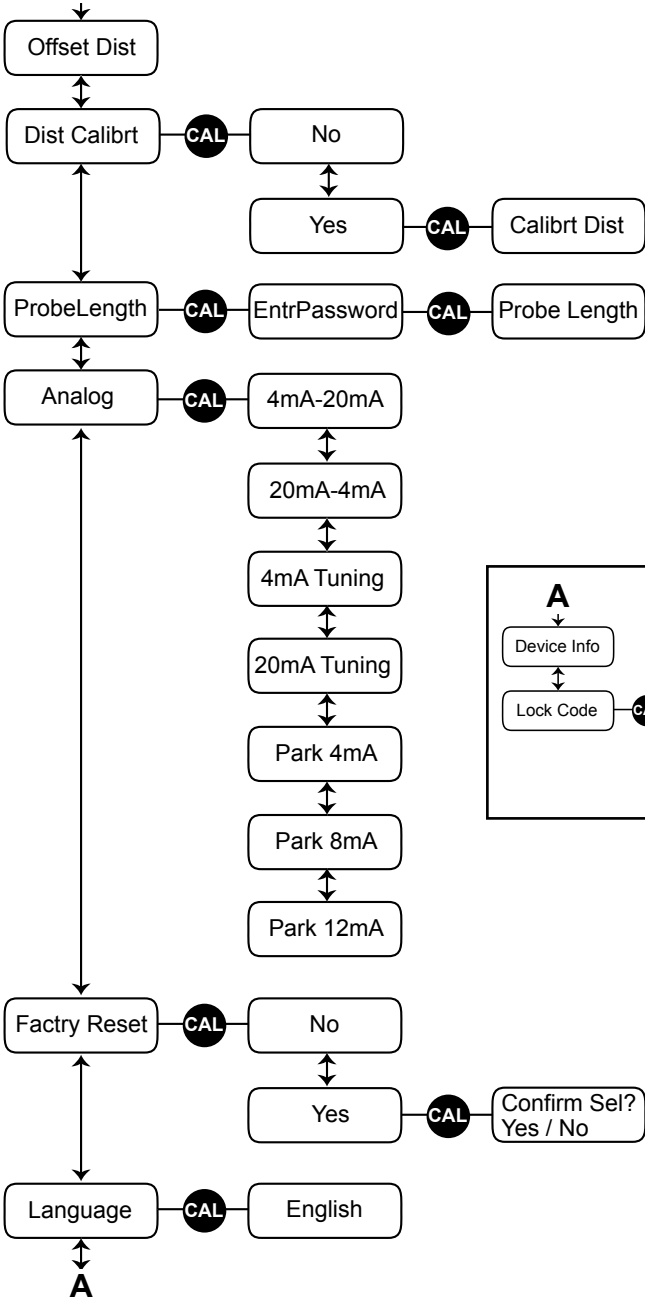
Autoset



Setup









Troubleshooting

Problem	Check
Display is blank Unit continually re-starts	Check incoming power on loop is to specification. Check incoming power on loop is continuous. Bench test with new 24V supply.
Measurement is non-responsive (material touching probe)	Run Digitize routine. If routine has already been run, Lower Dielectric selection or increase Sensitivity parameter. Check unit status for 'Failsafe'. The unit will go to Failsafe if it cannot detect any reflections. Check the probe element for damage or excessive build up. Ensure mounting is correct to specification with good ground reference. Ensure probe is not touching the vessel. Place current meter in line with loop. Ensure the 4-20mA is proportional to level reading based on High and Low level.
Unit is indicating a material level while no material is present	A) If the unit is indicating full / high Ensure no structure is making contact with the probe. Check for build up bridging between the probe and vessel / nozzle Run Digitize routine while no material is contacting the probe. Set Display Mode to Distance, note the measurement. If distance is near high level use Blanking to eliminate reflection interference. Adjust High level to ensure it is not within the Blanking range. B) If the unit is indicating other level The unit should measure the end of probe while nothing is touching the probe. Run Digitize routine while no material is contacting the probe. Confirm 'Low Level' is set correctly. Ensure no structure is making contact with the probe. Check for excessive build up and clean the probe. Ensure mounting is correct to specification with good ground reference. Place current meter in line with loop. Ensure the 4-20mA is proportional to level reading based on High and Low level. Use 4mA and 20mA tuning to force the output reading to each value to ensure the current control is operating correctly.
PLC reading does not match reading on display	Connect a Multimeter in series with the powered loop. Compare the 'mA' diagnostic on the display with the mA reading on the loop. If these values do not match, disconnect the loop wires and measure the resistance across the loop. This should not exceed specification. Confirm High Level and Low Level are set to the same values in CGR and control system.





Troubleshooting (con't)

Unit measurement is locked at or near end of probe	The material touching the probe may not be generating a large enough reflection in the application conditions. Ensure unit is mounted as per specifications. Take note of the ground reference requirement. Ensure the probe is not making contact with the vessel. Use a minimum 2" / 50mm flange to improve signal transmission. Change unit Tracking to 'Demo' mode to measure closest echo instead of largest. Increase Sensitivity.
The probe is too long	Non-hazardous rated units can have the probe length cut to requirement. For flexible probes release the cable weight by undoing grub screws. After adjusting the probe ensure the new probe length is recorded on site. Update ProbeCalibr parameter to new length. <u>Do not adjust the probe of hazardous location rated units.</u>
Adjusting / commissioning the unit without removing the lid	You will require a HART to PC connector and HAWK GoshawkII software. See 'CGR Goshawk user manual' for further information.
Digitize Fails	The digitization process will fail if the unit cannot detect a measurable difference between the largest false reflection and the reflection generated by either the end of probe or the material touching the probe. Choose a lower Dielectric pre-set and re-run Digitize. Increase Sensitivity value and re-run Digitize. Ensure the Digitize distance is not greater than the material level. Ensure no structure is making contact with the probe. Check for excessive build up and clean the probe. Ensure mounting is correct to specification with good ground reference.
Digitize displays incorrect distance	If Digitize displays a closer distance than the material level / end of probe enter the distance to the correct material level. The unit will automatically eliminate the detected echo and find the correct level. If Digitize displays a longer distance than the material level the measured material may not be returning a large enough signal. Increase Sensitivity and change Tracking to 'Test' mode. Ensure unit has conforming ground reference. If Digitize displays a longer distance than the end of the probe length adjust see 'Measurement Accuracy' below or the 'ProbeLength' parameter in 'Advanced' menu if the Probe length has been modified.
Measurement Accuracy	Material / Dielectric or environment can create small measurement inaccuracy. Run Dist Calibr parameter in software to manually adjust measured distance to new value.





Centurion Guided Radar System

Model

CGR2 2 wire Centurion Guided Radar

Communication

H 4-20mA with HART

Housing

- 1 Aluminum, Epoxy Painted
- 2 316L Stainless Steel

Gland Entry

- 1 1/2" NPT Cable gland entry
- 2 3/4" NPT Cable gland entry
- 3 M20 x 1.5 Cable gland entry
- 4 M25 x 1.5 Cable gland entry

Probe Type³

- A04 4mm flexible cable
- A06 6mm flexible cable
- A08 8mm flexible cable
- B04 4mm rigid probe
- B06 6mm rigid probe
- B08 8mm rigid probe

Probe variant / materials³

S 316L

Mounting³

- TN07 3/4" NPT Thread (316L) or threaded flange mount²
- TB07 3/4" BSP Thread (316L)
- TN10 1" NPT Thread (316L)
- TB10 1" BSP Thread (316L)
- TN15 1.5" NPT Thread (316L) or threaded flange mount²
- TB15 1.5" BSP Thread (316L)
- FXXX¹ Pre-Welded Flange (replace XXX with 3 character Welded Flange Code)

Process O-ring seal

- V FKM (Viton) (-20°C to +204°C)
- B NBR (-35°C to +110°C)
- S Silicone (-60°C to +230°C)

Process Temperature

- 1 -40°C to +80°C (-40 to +176°F)
- 2 -40°C to +150°C (-40 to +302°F)

Process Pressure

- 1 5 bar
- 3 20 bar
- 4 40 bar

Approval Standard

- XX Not Required
- 1D IECEx Ex d [ia] ia IIC T6 Gb Ga
- A2 ATEX Grp II Cat 3 GD IP66 Tamb -40°C to 60°C

Probe Length³

Specify in cm to the nearest 10cm

CGR2 H 1 3 B04 S TN15 B 1 1 1D 200

¹See Weld Code selection in Flange Table.

²Order flange as separate line item. See Probe / Mounting combination table matching size and variants options. See Flange Table Accessory Code for ordering.

³See Probe Table for valid Probe, Variant / Materials, Mounting and Length combinations prior to selection





Probe Combination Table

Probe / Mounting Combination Table

Each line represents valid part combinations

Probe Code	Variant / Materials	Mounting	Flange Sizes		Max. Length
			Min. Size	Max size	
A04	S	TN07, TB07, FXXX	1", DN25, 25mm	1-1/2", DN40, 40mm	1850cm
A06	S	TN10, TB10	N/A	N/A	1850cm
A08	S	TN15, TB15, FXXX	2", DN50, 50mm	4", DN100, 100mm	1850cm
B04	S	TN07, TB07, FXXX	1", DN25, 25mm	1-1/2", DN40, 40mm	400cm
B06	S	TN10, TB10	N/A	N/A	400cm
B08	S	TN15, TB15, FXXX	2", DN50, 50mm	4", DN100, 100mm	400cm

Accessories

Tank Fastening Kit

CGR-A0X-WL-SS

Kit includes:

Qty1 RIGGING-SCR-JAW-JAW-SS-M12

Qty2 EYEBOLT-SS-M10



Flange Table

Accessory Code	Welded Code	Type (all options Blind Flanges)	Material	Bore Hole (threaded type only)	Matching Mounting Thread (threaded type only)
FLA-1A1-SS-TN07	F1A1	1" ANSI B16.5 150LB	316L	3/4" NPT	TN07
FLA-1A3-SS-TN07	F1A3	1" ANSI B16.5 300LB	316L	3/4" NPT	TN07
FLA-1A6-SS-TN07	F1A6	1" ANSI B16.5 600LB	316L	3/4" NPT	TN07
FLA-1A9-SS-TN07	F1A9	1" ANSI B16.5 900LB	316L	3/4" NPT	TN07
FLA-1AA-SS-TN07	F1AA	1" ANSI B16.5 1200LB	316L	3/4" NPT	TN07
FLA-1AB-SS-TN07	F1AB	1" ANSI B16.5 2500LB	316L	3/4" NPT	TN07
FLA-HA1-SS-TN07	FHA1	1-1/2" ANSI B16.5 300LB	316L	3/4" NPT	TN07
FLA-HA3-SS-TN07	FHA3	1-1/2" ANSI B16.5 600LB	316L	3/4" NPT	TN07
FLA-HA6-SS-TN07	FHA6	1-1/2" ANSI B16.5 900LB	316L	3/4" NPT	TN07
FLA-HA9-SS-TN07	FHA9	1-1/2" ANSI B16.5 900LB	316L	3/4" NPT	TN07
FLA-HAA-SS-TN07	FHAA	1-1/2" ANSI B16.5 1200LB	316L	3/4" NPT	TN07
FLA-HAB-SS-TN07	FHAB	1-1/2" ANSI B16.5 2500LB	316L	3/4" NPT	TN07
FLA-2A1-SS-TN15	F2A1	2" ANSI B16.5 150LB	316L	1.5" NPT	TN15
FLA-2A3-SS-TN15	F2A3	2" ANSI B16.5 300LB	316L	1.5" NPT	TN15
FLA-2A6-SS-TN15	F2A6	2" ANSI B16.5 600LB	316L	1.5" NPT	TN15
FLA-2A9-SS-TN15	F2A9	2" ANSI B16.5 900LB	316L	1.5" NPT	TN15
FLA-2AA-SS-TN15	F2AA	2" ANSI B16.5 1200LB	316L	1.5" NPT	TN15
FLA-2AB-SS-TN15	F2AB	2" ANSI B16.5 2500LB	316L	1.5" NPT	TN15
FLA-3A1-SS-TN15	F3A1	3" ANSI B16.5 150LB	316L	1.5" NPT	TN15
FLA-3A3-SS-TN15	F3A3	3" ANSI B16.5 300LB	316L	1.5" NPT	TN15
FLA-3A6-SS-TN15	F3A6	3" ANSI B16.5 600LB	316L	1.5" NPT	TN15
FLA-3A9-SS-TN15	F3A9	3" ANSI B16.5 900LB	316L	1.5" NPT	TN15
FLA-3AA-SS-TN15	F3AA	3" ANSI B16.5 1200LB	316L	1.5" NPT	TN15
FLA-3AB-SS-TN15	F3AB	3" ANSI B16.5 2500LB	316L	1.5" NPT	TN15
FLA-4A1-SS-TN15	F4A1	4" ANSI B16.5 150LB	316L	1.5" NPT	TN15
FLA-4A3-SS-TN15	F4A3	4" ANSI B16.5 300LB	316L	1.5" NPT	TN15
FLA-4A6-SS-TN15	F4A6	4" ANSI B16.5 600LB	316L	1.5" NPT	TN15
FLA-4A9-SS-TN15	F4A9	4" ANSI B16.5 900LB	316L	1.5" NPT	TN15
FLA-4AA-SS-TN15	F4AA	4" ANSI B16.5 1200LB	316L	1.5" NPT	TN15
FLA-4AB-SS-TN15	F4AB	4" ANSI B16.5 2500LB	316L	1.5" NPT	TN15
FLA-1D1-SS-TN07	F1D1	DN25 DIN2527 PN16	316L	3/4" NPT	TN07
FLA-1D4-SS-TN07	F1D4	DN25 DIN2527 PN40	316L	3/4" NPT	TN07
FLA-HD1-SS-TN07	FHA1	DN40 DIN2527 PN16	316L	3/4" NPT	TN07
FLA-HD4-SS-TN07	FHD4	DN40 DIN2527 PN40	316L	3/4" NPT	TN07
FLA-2D1-SS-TN15	F2D1	DN50 PN16	316L	1.5" NPT	TN15
FLA-2D4-SS-TN15	F2D4	DN50 PN40	316L	1.5" NPT	TN15
FLA-3D1-SS-TN15	F3A1	DN80 PN16	316L	1.5" NPT	TN15
FLA-3D4-SS-TN15	F3D4	DN80 PN40	316L	1.5" NPT	TN15
FLA-4D1-SS-TN15	F4A1	DN100 PN16	316L	1.5" NPT	TN15
FLA-4D4-SS-TN15	F4D4	DN100 PN40	316L	1.5" NPT	TN15
FLA-1J1-SS-TN07	F1J1	JIS 25mm 16k	316L	3/4" NPT	TN07
FLA-1J4-SS-TN07	F1J4	JIS 25mm 40k	316L	3/4" NPT	TN07
FLA-HJ1-SS-TN07	FHJ1	JIS 40mm 16k	316L	3/4" NPT	TN07
FLA-HJ4-SS-TN07	FHJ4	JIS 40mm 40k	316L	3/4" NPT	TN07
FLA-2J1-SS-TN15	F2J1	JIS 50mm 16k	316L	1.5" NPT	TN15
FLA-2J4-SS-TN15	F2J4	JIS 50mm 40k	316L	1.5" NPT	TN15
FLA-3J1-SS-TN15	F3J1	JIS 80mm 16k	316L	1.5" NPT	TN15
FLA-3J4-SS-TN15	F3J4	JIS 80mm 40k	316L	1.5" NPT	TN15
FLA-4J1-SS-TN15	F4J1	JIS 100mm 16k	316L	1.5" NPT	TN15
FLA-4J4-SS-TN15	F4J4	JIS 100mm 40k	316L	1.5" NPT	TN15



Electronics

Power

- 2 wire loop powered
- 24VDC (14 to 28VDC)

Power Consumption

- <500mW @ 24VDC

Analog Output

- 14V @ 0 Ohm
- 19V @ 250 Ohms
- 24V @ 500 Ohms
- Current park at 4mA, 8mA, 12mA

Communications*

- HART (Revision 5, Universal & Common Practice commands).
- GoshawkII via HART. Full parameter list

Maximum Range

- Flexible cable probe: 18.5m (60ft 8in)
- Rigid probe: 4m (13ft 1in)

Minimum Range (Blanking)

- 150mm (6")

Dielectric Range

- ≥ 1.5

Frequency

- 2.2 GHz

Resolution

- Analog: 1uA
- Display: 1.0mm

Accuracy¹

- +/- 3mm

Measurements per second

- 3

Response Time

- <1 second (based on application selection)

Sum of non linearity, non repeatability, hysteresis

- Analog +/- 0.02%

Repeatability

- +/- 3mm

Memory

- Non-Volatile (No backup battery required)
- >10 years data retention

Operating Temperature (Electronics)

- -40°C to +80°C (-40 to +176°F)

Display

- 4 line graphic display (128 x 64 pixels)

Language

- English

Configuration

- 4 button (Up, Down, Cal, Run), GoshawkII via HART

Approvals*

- IECEx Zone 0/1, Zone 1
- IECEx TSA 14.0037X
- Ex d [ia] ia IIC T6 Gb Ga
- Tamb = -40°C to +60°C (-40 to +140°F)
- IP 66, NEMA 4X
- (T6 ... T1)
- ATEX Grp II Cat 3 GD IP66 Tamb -40°C to 60°C

Cable Entries

- 1/2" NPT
- 3/4" NPT
- M20 x 1.5
- M25 x 1.5

Enclosure

Type

- Dual Compartment with Glass window

Material

- Die-cast Copper-Free Aluminum, Epoxy Painted
- 316L Stainless

Cable Entries

- 1/2" NPT
- 3/4" NPT
- M20 x 1.5
- M25 x 1.5

IP Rating

- NEMA 4X
- IP66

^{*}Specifications model dependent. Consult part number listing.

¹Accuracy dielectric & material dependent



Specifications

Centurion Guided Radar



Probe

Probe Size / Wetted Materials

- 4mm SS316L rod
- 4mm DIN3055 (7x7 strand) SS316L flexible cable
- 6mm SS316L rod
- 6mm DIN3055 (7x7 strand) SS316L flexible cable
- 8mm SS316L rod
- 8mm DIN3055 (7x7 strand) SS316L flexible cable

Probe Entry Wetted Materials²

- TN07 / TB07 / TN10 / TB10 / Welded Flange¹ - PEEK
- TN15 / TB15 / Welded Flange¹ - PTFE + GF25

¹ See Probe / Mounting Combination Table for flange types

Probe O-Ring Seals

- Silicone / VMQ (-60°C to +230°C)
- NBR (-35°C to +110°C)
- Viton (-20°C to +204°C)

Process Connections

- 3/4" NPT or BSP
- 3/4" NPT with Flange
- 1" NPT or BSP
- 1.5" NPT or BSP
- 1.5" NPT with Flange
- Welded Flange

Electromagnetic Compatibility



CAN ICES-3(A)/NMB-3(A)

This device complies with Part 15, Subpart B Class A of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Process Pressure*

- -1 to 40 BAR

Process Temperature*

- -40°C to +80°C (-40 to +176°F)
- -40°C to +150°C (-40 to +302°F)

Tensile Load (flexible cable probes)

- | | |
|-------------------|---------|
| • Probe Type: A04 | 0.5 ton |
| • Probe Type: A06 | 1.0 ton |
| • Probe Type: A08 | 4.0 ton |

Lateral Load (rigid probes)

- | | |
|-------------------|------|
| • Probe Type: B04 | 1 Nm |
| • Probe Type: B06 | 3 Nm |
| • Probe Type: B08 | 8 Nm |

Maximum Probe Length

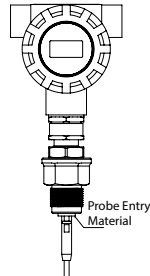
- | | |
|-------------------|--------|
| • Probe Type: A04 | 1850cm |
| • Probe Type: A06 | 1850cm |
| • Probe Type: A08 | 1850cm |
| • Probe Type: B04 | 400cm |
| • Probe Type: B06 | 400cm |
| • Probe Type: B08 | 400cm |

Minimum Probe Length

- | | |
|-------------------|-------|
| • Probe Type: A04 | 100cm |
| • Probe Type: A06 | 100cm |
| • Probe Type: A08 | 100cm |
| • Probe Type: B04 | 20cm |
| • Probe Type: B06 | 20cm |
| • Probe Type: B08 | 20cm |

*Specifications model dependent. Consult part number listing.

² Probe Entry



Centurion Guided Radar

Level measurement of liquids, sludge,
powders and granules to a distance of
18.5 metres.





Ordering Instructions

Threaded unit type

Assemble part number taking note of the valid combinations and exclusions for the full system.

The unit is ordered as a single line item. For example:

CGR2H13B08STB15B11XX200

Flanged type - Threaded flange

Assemble part number taking note of the valid combinations and exclusions for the full system (noting smaller flanges require TN07 threaded unit and larger flanges require TN15 threaded unit). The unit and the threaded flange are ordered as separate line items. For example:

CGR2H13B08STN15B11XX200

FLA-FA4-SS-TN15

or

CGR2H13B08STN07B11XX200

FLA-FA1-SS-TN07

Flanged type - Welded flange

Assemble part number taking note of the valid combinations and exclusions for the full system.

In the Mounting part code enter 4 character Welded flange code from the table. All Welded flanges have F as the first character. For example:

CGR2H13B08SF4A1B11XX200

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Technical data subject to change without notice.